

Standards and Guidelines for Statewide EMS System Evaluation

**Final Project Report
Special Project EMS# 8039
1998 - 2000**



**Conducted by Mountain-Valley EMS Agency,
Los Angeles County EMS Agency, North Coast EMS Agency**

**In consultation with Children's Hospital and
Health Center -- San Diego, California**

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for their valuable contributions to this project.

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EXECUTIVE SUMMARY

The need for a comprehensive evaluation of the California EMS system has been voiced throughout the state by the State EMS Authority (EMSA), the Emergency Medical Services Administrators Association of California (EMSAAC), the Emergency Medical Directors Association of California (EMDAC) and the California Commission on Emergency Medical Services. These organizations and their constituents recognize that a coordinated and integrated system for conducting effective EMS system evaluation is not in place and that there is a lack of structure and oversight in the approach to EMS quality improvement in California.

In order to begin to address these concerns, a two-year grant was awarded to the Los Angeles, Mountain-Valley and North Coast EMS Agencies in cooperation with EMSAAC in July 1998. The purpose of grant was to generate both a process for EMS system evaluation and a forum to implement continuous quality improvement at a statewide level. A consortium of EMS agencies and providers throughout the state was convened to develop and model a method for evaluating and improving the California EMS system.

As a result of two years hard work, project participants succeeded in developing:

- An organizational structure with clearly defined roles and responsibilities
- A defined set of system-wide and regional quality indicators
- A sequence of steps for continuous quality improvement based on the Rapid Cycle Improvement model
- A needs assessment tool to evaluate EMS agencies' and providers' ability to gather pertinent data and effectively participate in a quality improvement project

Simultaneously, the EMS Commission and the State EMS Authority were engaged in a statewide vision process for emergency medical services. The goals of the vision process, particularly the objectives set forth by the System Review and Data Group, influenced the direction of this grant project. The action plan proposed by the System Review and Data Group includes the establishment of standardized performance indicators to facilitate comparative analysis of EMS system performance among local systems and EMS providers. This grant project has actualized that objective by defining and collecting data on performance indicators. The real-life challenges and wins experienced and the concrete lessons learned during this endeavor have, in turn, informed the vision process.

The experiences of project participants documented herein provide a strong foundation for the continuing development of a statewide EMS system evaluation and quality improvement program. It is hoped that the accomplishments and valuable insights gained as a result of this project will be incorporated and carried forward by locally-based evaluation and quality improvement programs and by the statewide EMS vision process, as supported by the newly awarded OTS grant.

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ABSTRACT

Introduction

The need for an effective evaluation model for EMS systems is documented in the National Highway Traffic Safety Administration (NHTSA) publication, *Emergency Medical Services: Agenda for the Future*. It states, "The ability of EMS systems to optimally meet communities' and individual patients' needs in the future is dependent on evaluation processes that assess and improve the quality of EMS" (1996: 57). Yet models for determining EMS system effectiveness are lacking. The San Mateo County EMS Agency raised awareness regarding the need for comprehensive standardized guidelines to evaluate and improve EMS system performance in the report, *Managing Change to Improve Emergency Medical Services* (1995). In addition, the Mountain-Valley EMS Agency described the use of quality indicators to measure performance in *EMS System Evaluation - Using Quality Indicators to Evaluate System Variation and Benchmark Performance* (1997). These reports make it clear that standards and guidelines should define the minimum benchmark structural, process, and outcome indicators, and their associated data elements. These definitions and standards must be consistent statewide before any broad-based EMS system analysis and improvement can occur.

Project Description

The purpose of this project was to produce an EMS system evaluation model establishing minimum standards and guidelines for EMS system evaluation in California. This document defines an organizational structure, quality indicators, and operating procedures for EMS system evaluation at the state and local levels. In addition, it describes methods and processes for engaging in quality improvement utilizing the Rapid Cycle Improvement (RCI) model.

Project Goals

- Develop Statewide Organizational Structure and Oversight for EMS System Evaluation
- Develop Sample Indicators and Associated Data Collection Points
- Develop Model Operating Procedures
- Develop Recommendations for Implementation of Standards and Guidelines

Outcomes

Established an informal consortium of EMS agencies and providers.

Developed a proposed statewide organizational structure.

Surveyed EMS agency administrators, medical directors, and other EMS personnel to identify and prioritize system indicators.

Defined indicators and conducted data collection cycles to refine those indicators.

Mapped out a model for engaging in quality improvement using Rapid Cycle Improvement.

Began sharing results in publications and presentations (Sobo et al. 2000a; 2000b; n.d.).

Conclusion

The project was successful in establishing an organizational structure, developing operating procedures and defining quality indicators for EMS system evaluation. Lessons learned will benefit future endeavors to continually assess and improve EMS systems throughout California.

PROJECT HISTORY

In May 1997, the Emergency Medical Services Administrators Association of California (EMSAAC) held their annual statewide conference in San Diego. The goal was to assess the current processes for EMS system evaluation in California. Much of the two-day conference focused on the need for objective analysis and scientific research to serve as a basis for EMS system management. At the conclusion of the seminar, a post-conference roundtable discussion was held with conference participants, system leaders, and members of EMSAAC. Following these discussions, a summary conference paper was generated listing problems with the current practices of EMS system evaluation. The conference paper asserts that there is a serious lack of structure and standardization in the approach to EMS system evaluation and research in California.

The California Commission on Emergency Medical Services also highlighted the importance of this problem. In 1997, the EMS Commission identified both system evaluation and data collection as priority areas to be addressed by task teams as part of their statewide *Vision for EMS* planning efforts. The *Vision for EMS* project was undertaken by the State EMS Authority and the EMS Commission in an effort to develop a long-awaited statewide plan for EMS. As part of this project, the Commission adopted seven EMS Vision goals at their January 1998 meeting. The second of these goals was to “develop and implement a system that could define and measure quality EMS care.” The third goal was to “develop a comprehensive statewide integrated information system.”

In July 1998, Mountain-Valley EMS Agency began working with consultants from Center for Child Health Outcomes of Children’s Hospital and Health Center, San Diego to develop a statewide EMS system evaluation and quality improvement program. The goal of the project was to produce both a process for EMS system evaluation and a forum to implement quality improvement at a statewide level. The project was funded by a federal block grant through the State EMS Authority. The grant was shared with Los Angeles and North Coast EMS agencies and was supported by Emergency Medical Services Administrators Association of California (EMSAAC).

The goals of the grant project were to develop methods for evaluating and improving EMS systems and to simultaneously model those methods. In this way, project participants were able to pinpoint strengths and weaknesses and make modifications to the evaluation and improvement process as it was being developed. In order to establish an organizational structure and create operational procedures, project staff purposefully set EMS system evaluation apart from EMS system improvement, although each component is essential and clearly dependent upon the other. The project distinguishes system evaluation as the 'monitoring phase' and system improvement as the 'changing phase'. One of the valuable lessons learned was that effective change (improvement) cannot occur unless methods for collecting data (evaluation) have been standardized.

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In year one of the project, an informal consortium of EMS agencies and providers from around the state was established. The consortium focused on developing an organizational model, creating a process for action, and devising specific tools to measure performance. Project participants also engaged in a round of baseline data collection on cardiac chest pain. This was a learning exercise that identified questions to be answered through future data collection efforts and highlighted areas where it was difficult to obtain data.

The second year of the project was devoted to refining the organizational model and developing quality indicators to measure EMS system performance across the state. During year two, the consortium completed two more data collection cycles demonstrating a process to define, gather, and analyze EMS system information collectively. Strengths and weaknesses in data collection were identified and a model for processing and acting on EMS system information once it has been collected was demonstrated. While the consortium did not engage in quality improvement collectively, the proposed improvement model (Rapid Cycle Improvement) was utilized on an individual agency level by the Mountain-Valley EMS Agency.

What follows is a detailed description of the organizational structure and suggested operating procedures for EMS system evaluation and EMS system improvement throughout the state of California.

EMS System Evaluation

EMS SYSTEM EVALUATION

Organizational Structure and Operating Procedures

The Project Consortium

The recommended organizational structure for EMS system evaluation is a broad-based consortium, which provides a statewide forum for collecting, evaluating and acting on information to improve EMS system performance. Essential components of the consortium include oversight, advisory, management, and support functions. For the grant period, the project's Advisory Board members served as agents for collecting and evaluating data. Advisory Board members both volunteered and were appointed at the beginning of the grant period to provide feedback and help build consensus during project development. Management functions were carried out by the project director and the project coordinator with assistance from technical consultants at the Center for Child Health Outcomes in San Diego. The consortium met face-to-face quarterly, and also maintained contact by teleconference and e-mail (a list serve was successfully established at the beginning of the project to facilitate communication). This informal network provided the framework for the more extensive and formal consortium described below.

Background

In 1996, the National Highway Traffic Safety Administration published a document that called for the development of valid EMS evaluation models (*EMS Agenda for the Future*). The document emphasized the need for EMS system administrators, researchers and providers to collaborate on the development and implementation of such programs. In December 1998, the state of California Emergency Medical Services Authority (EMSA) hosted a comprehensive planning conference, "Shaping the Future of EMS in California." The conference called for a consensus among all stakeholders in the development and planning of EMS systems into the year 2000 and beyond. The results of this planning process included a state vision document with 66 objectives targeted for implementation over the next three years. Objective D-10 confirmed the national recommendation of NHTSA by specifically identifying the need for an EMS system evaluation structure within the state of California. The organizational structure identified in this plan is based upon three basic premises: 1) the national agenda for the future has provided guidance for the direction of development, 2) the state vision process has provided a preview of the lead agencies and their prospective goals and objectives, and 3) these lead agencies will ultimately assume and implement the organizational structure for EMS system evaluation.

Structural Design

The recent progress of the state vision and planning process serves as the foundation for an EMS organizational structure within the state of California. Within this existing structure, are three distinct levels of organization: the state EMS Authority (EMSA), local EMS agencies (LEMSA) and local EMS service providers (EMSP). Organizations at all of these levels have demonstrated an effective network capable of serving EMS customers through the implementation and management of several existing statewide programs such as trauma planning, paramedic

licensure, and disaster management. These programs provide the framework for integrating a statewide EMS system evaluation program.

The key component of the proposed organizational structure is the establishment of sub-units within the lead agencies. These sub-units will have specific responsibilities for carrying out the statewide EMS system evaluation and improvement program objectives. The three organizational levels are described in detail below. They each have the same objective: To measure and report the status of development, degree of compliance with requirements, and the effectiveness of emergency medical services systems in reducing morbidity and mortality associated with prehospital medical emergencies.

Objective

To measure and report the status of development, degree of compliance with requirements, and the effectiveness of emergency medical services systems in reducing morbidity and mortality associated with prehospital medical emergencies

LEVEL 1 - STATE OF CALIFORNIA

RESPONSIBLE AGENCY

Emergency Medical Services Authority (EMSA)

AUTHORITY

Division 2.5 Health & Safety Code; Chapter 1, Section 1797.1: "The Legislature finds and declares that it is the intent of this act to provide the state with a statewide system for emergency medical services by establishing within the Health and Welfare Agency the EMS Authority, which is responsible for coordination and integration of all state activities concerning emergency medical services."

SUB UNIT

State EMS System Evaluation Section

STRUCTURE

The EMS System Evaluation Section will be a subordinate unit of the EMS Authority of the State of California with an organizational structure as follows:

- 1) A distinct sub-unit of the state EMS Authority, under the direction of the state EMS Authority.

- 2) An advisory group with requirements for state representation to include but not limited to: EMS System Medical Directors, EMS System Administrators, EMS Hospital and Field Providers, EMS Specialty Centers, EMS System Customers.

STAFFING

The EMS System Evaluation and Improvement Section will provide necessary and reasonable staff services and appropriate office facilities. Staff will have expertise in administration and management of EMS data systems, EMS evaluation and EMS quality improvement.

RECOMMENDED STAFFING

- Section Manager or Coordinator
- Clinical Quality Improvement Specialist
- Data Systems Specialist/Manager
- Bio-Statistical Specialist
- Clinical Consultants and Resources
- Clerical Staff/Support

STANDARD OPERATING PROCEDURES

The EMS System Evaluation and Improvement Section will be the central repository of statewide EMS System information. Under the direction of EMS Authority Medical Director and the State EMS System Evaluation Advisory Committee the EMS System Evaluation and Improvement Section will perform the following functions.

- Assist the EMS Authority in carrying out the responsibilities of the EMS System Evaluation and Improvement Program
- Assist the EMS Authority in the development, approval, and implementation of state standardized EMS system indicators and other pertinent information as indicated by the EMS System Evaluation Program
- Maintain responsibility for monitoring, collecting and evaluating state standardized EMS system indicators
- Provide a standardized format for reporting standardized EMS system indicators
- Monitor, collect, organize, prepare, analyze, and provide feedback to participating agencies on state standardized EMS system indicators
- Facilitate meetings and presentations of state standardized EMS system indicators for collegial review to designated advisory groups and other authorized constituents
- Establish a mechanism to provide input from local EMS service providers and other participating agencies
- Assure reasonable availability of training and 'in service' for EMS providers and personnel on the EMS System Evaluation Plan
- Prepare plans for expanding or improving the EMS System Evaluation Program
- Re-evaluate, expand and improve state standardized EMS system indicators

ANNUAL REPORTS

The EMS System Evaluation and Improvement Section will annually publish comprehensive, specific reports of activity and plan implementation.

LEVEL 2 - LOCAL EMERGENCY MEDICAL SERVICES SYSTEM

RESPONSIBLE AGENCY

Local or Regional Emergency Medical Services Agency

AUTHORITY

100141. Title 22. Division 9. Pre hospital Emergency Medical Services Organization: Division 2.5 Health & Safety Code; Chapter 1, Section 1797.1

ORGANIZATIONAL SUB UNIT

Local EMS System Evaluation & Improvement Division

STRUCTURE

The Local EMS System Evaluation Division will be a subordinate functional component of the Local EMS Agency with an organizational structure as follows:

- 1) A distinct component of the Local EMS Agency under the direction of the Local EMS Agency.
- 2) Advisory group with requirements for local representation to include but not limited to EMS System Medical Director, EMS System Administrators, EMS System CQI Coordinators, EMS System Hospital Physicians and/or Coordinators, EMS Service Provider Agencies, EMS Specialty Centers, EMS System Customers

STAFFING

The Local EMS System Evaluation and Improvement Division will provide necessary and reasonable staff services and appropriate office facilities. Staff will have expertise in administration and management of EMS data systems, EMS evaluation and EMS quality improvement. The following staffing positions are recommended (smaller organizations with limited resources may combine positions):

- Quality Improvement Specialist
- Data Systems Specialist/Manager
- Clerical Staff/Support

STANDARD OPERATING PROCEDURES

The EMS System Evaluation and Improvement component will be the central repository of local or regional EMS System information. Under the direction of Local EMS Medical Director and the Local EMS System Evaluation Advisory Committee the EMS System Evaluation and Improvement Section will perform the following functions.

- Assist the EMS Authority in carrying out the responsibilities of the EMS System Evaluation and Improvement Program
- Assist the EMS Authority in the development, approval, and implementation of state standardized EMS system indicators and other pertinent information as indicated by the EMS System Evaluation Program
- Develop local/regional standardized indicators specific to local/regional needs

- Maintain responsibility for monitoring, collecting and evaluating state and local standardized EMS system indicators
- Provide a standardized format for reporting standardized EMS system indicators
- Monitor, collect, and report state and local standardized EMS system indicators
- Facilitate meetings and presentations of state and local standardized EMS system indicators for collegial review to local designated advisory groups and other authorized constituents
- Establish a mechanism to provide input from local EMS service providers and other participating agencies
- Assure reasonable availability of training and in service for EMS providers and personnel on the EMS System Evaluation Plan
- Prepare plans for expanding or improving the EMS System Evaluation Program
- Re-evaluate, expand and improve state and local standardized EMS system indicators

ANNUAL REPORTS

The EMS System Evaluation and Improvement Component will annually publish comprehensive, specific reports of activity and plan implementation.

LEVEL 3 - LOCAL EMERGENCY MEDICAL SERVICE PROVIDERS

RESPONSIBLE AGENCY

Dispatch Agencies, First Responder Agencies, Ambulance Providers, Hospitals, Specialty Care Centers

ORGANIZATIONAL SUB UNIT

Local EMS System Provider CQI Program

STRUCTURE

The EMS System Provider CQI program will be a formal program of the Local EMS System provider agency approved by the Local EMS Agency with an organizational structure as follows:

- 1) Involvement in the local EMS system CQI program under the direction of the Local EMS Agency.
- 2) An internal CQI process and program with members, which include, but are not, limited to:
 - Provider Medical Director
 - Provider Administrator
 - Provider CQI Coordinator

- Provider Service Personnel (Physicians, RNs, EMTs)
- Provider End Customers

STAFFING

The Local EMS System Provider CQI Program will provide necessary and reasonable staff services and appropriate office facilities. Lead staff will have expertise in management of EMS evaluation and EMS quality improvement. The following staffing positions are recommended (smaller organizations with limited resources may combine positions):

- Program Medical Director
- Quality Improvement Coordinator
- Data Manager

STANDARD OPERATING PROCEDURES

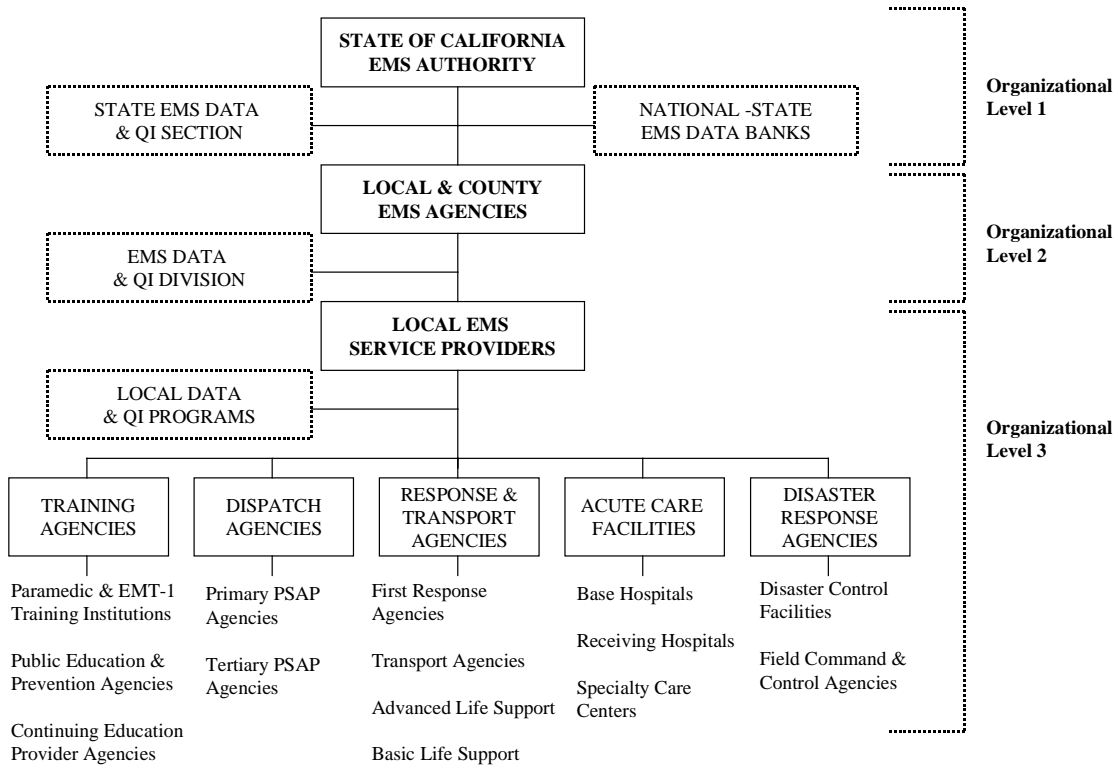
The Local EMS Service Provider CQI Program will be the primary source of EMS activity reporting for statewide and local EMS system information. Under the direction of EMS Authority and the Local EMS Agency, the EMS Service Provider CQI program will perform the following functions.

- Assist the Local EMS Agency in carrying out the responsibilities of the EMS System Evaluation and Improvement Program
- Assist the Local EMS Agency in the development, approval, and implementation of state standardized EMS system indicators and other pertinent information as indicated by the EMS System Evaluation Program
- Develop local/regional standardized indicators specific to local/regional needs
- Assist the Local EMS Agency in monitoring, collecting and evaluating state and local standardized EMS system indicators
- Utilize standardized indicators as the primary reporting format for EMS system activity
- Facilitate meetings for internal collegial review of local EMS provider information or other authorized constituents
- Establish a mechanism to provide input from local EMS service provider end customers or other effected agencies
- Assure reasonable availability of training and 'in service' for EMS service provider personnel
- Prepare plans for expanding or improving the Local EMS Service Provider CQI Program
- Assist in the re-evaluation, expansion and improvement of state and local standardized EMS system indicators

ANNUAL REPORTS

The EMS Service Provider CQI Program will annually publish comprehensive and specific reports of CQI plan activity.

Organizational Chart Overview



EMS SYSTEM EVALUATION

Demonstration Project

In September 1999, the project consortium tested the organizational structure by assembling a team to role-play each of the lead agencies' responsibilities. Roles were assigned as follows:

ORGANIZATION/AGENCY

ROLE PLAYER

Level 1: State EMS Authority

State System Evaluation & Improvement Section

Mountain-Valley EMS Agency
Children's Hospital San Diego: Center for
Child Health Outcomes

Level 2: Local EMS Agencies

System Evaluation & Improvement Divisions

Los Angeles County EMS Agency
Marin County EMS Agency
Mountain-Valley EMS Agency
North Coast EMS Agency
Sierra-Sacramento EMS Agency

Level 3: Local EMS Providers

Evaluation & Improvement Programs

American Medical Response San Diego
Long Beach Fire Department
San Diego Fire Department
UCSD Hospital

Select providers from the following:

Los Angeles County EMS
Marin County EMS
Sierra-Sacramento County EMS
Stanislaus County EMS

QUALITY INDICATORS

The primary tool proposed for statewide EMS system evaluation is the development and utilization of standardized quality indicators. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) defines an indicator as "a measure used to monitor and improve the quality of important governance, management, clinical, and support services that strongly affect patient outcomes" (1991: 7). See Appendix A for a sample performance indicator, as well as, an index of the indicators approved during this grant project. Methods for developing and using quality indicators to measure EMS system performance are described in the forthcoming companion document: *Developing and Utilizing Quality Indicators for EMS System Evaluation and Improvement*.

THE PROCESS

1. Development of Standardized Quality Indicators

Mountain-Valley EMS and the Center for Child Health Outcomes facilitated the process of developing standardized indicators. On the basis of findings from a survey of 23 variously placed EMS personnel and conclusions from the 1999 Vision Process meeting, the project consortium chose nine indicators and reached consensus on the definitions, inclusion criteria, data numerators and denominators, and reporting format.

2. Collection of Data

Utilizing the standardized data fields for each indicator, the grant team members serving as Local EMS Agencies (level 2) collected the indicator data elements from their local EMS service providers (level 1).

3. Organizing & Reporting the Indicators

The data were then organized into the specified indicator format by the Local EMS Agencies (level 2) and reported to Mountain-Valley EMS and the Center for Child Health Outcomes (level 1), which served as the central repository for the indicators. See Appendix B for examples of indicator reporting forms.

4. Indicator Analysis

The indicator data were analyzed by Mountain-Valley EMS and the Center for Child Health Outcomes (level 1). Analysis included: 1) measurements of central tendency and variation (e.g., mean, mode, standard deviation), 2) benchmark comparisons, and 3) process analysis (i.e., identification of trends and special causes).

5. Indicator Feedback

Each Local EMS Agency collecting indicator data (level 2) received an indicator report showing results of the analyses. The results from all reporting agencies were presented for blinded comparison. These comparison reports were presented in easily understood formats such as bar charts, line graphs, and process control charts.

6. Evaluation of Indicators

The consortium met in November of 1999 in San Francisco to evaluate the results of the indicator exercise. The meeting was coordinated and facilitated by Mountain-Valley EMS and the Center for Child Health Outcomes (level 1). Both Local EMS Agencies (level 2) and Local EMS Providers (level 3) attended. The objectives of the meeting were to review the results and recommend action to improve the process.

7. Acting to Improve

At the meeting in November 1999, the consortium decided not to initiate an improvement cycle. The consensus of the consortium was that it was too early in the process to make system-wide changes. Given difficulties encountered during data collection, participants were uncertain as to whether they could trust the data. In an effort to standardize the data collection process before moving forward with improvement, the consortium decided to revise several indicator attributes, develop a dispatch time survey (see Appendix C) and perform another indicator feasibility test in January 2000.

EMS System Improvement

EMS SYSTEM IMPROVEMENT

Organizational Structure

EMS system improvement is inextricably linked to EMS system evaluation. The authors of *Emergency Medical Services: Agenda for the Future* state that "Evaluation is the essential process of assessing the quality and effects of EMS, so that strategies for continuous improvement can be designed and implemented" (NHTSA 1996: 57). Comprehensive evaluation lays the foundation upon which improvement will occur. The diagram on the following page illustrates the organizational structure for analysis, evaluation, and improvement and demonstrates the fundamental interconnectedness of these two critical components.

Continuous Quality Improvement

Continuous Quality Improvement (CQI) is an approach to quality management that builds on traditional Quality Assurance (QA) methods by emphasizing organizational systems and processes (rather than individuals); the need for objective data with which to analyze and improve processes and outcomes; and the idea that processes, outcomes, and performance can be improved even when high standards appear to have been met. While QA focuses on eliminating negative outliers in a system, CQI looks at how the performance of a system as a whole can be enhanced by making constant improvements in all areas of the system.

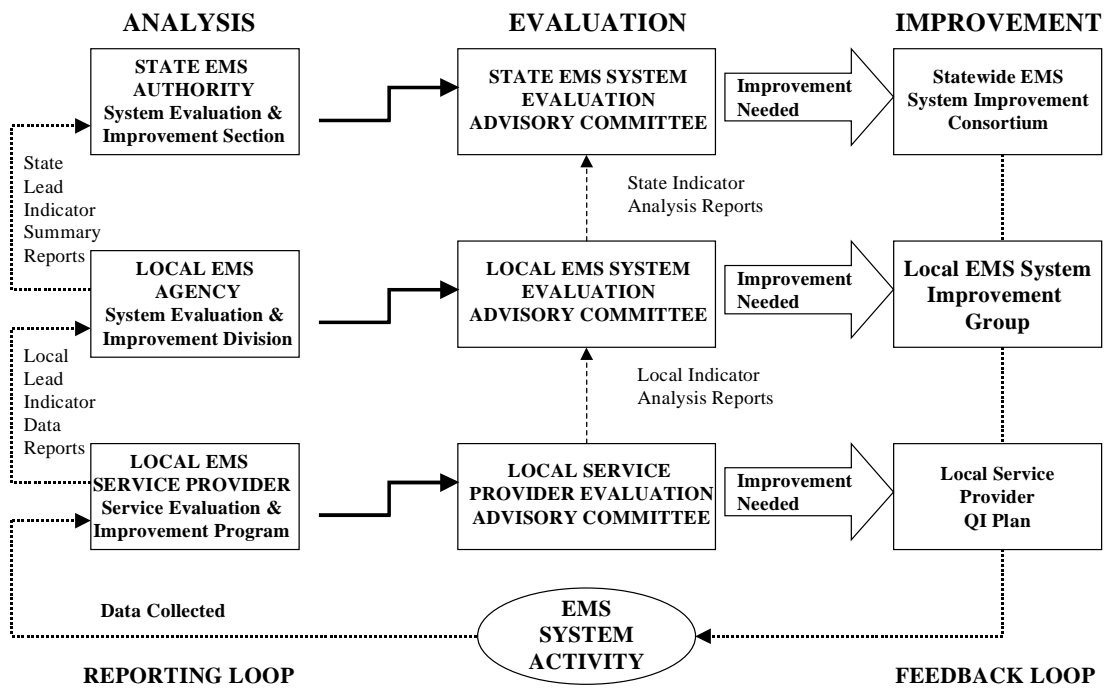
Rapid Cycle Improvement

One approach to continuous quality improvement is Rapid Cycle Improvement (RCI), which is based on Deming's traditional "Plan-Do-Study-Act" model. While CQI emphasizes incremental changes over time, RCI accelerates the process by employing shorter change cycles. Rapid Cycle Improvement is a practical and real-time approach to enhancing performance in diverse organizations. It is an especially valuable tool in making improvements in large or complex systems (Langley et al. 1996).

Consortium-Based Improvement

EMS agencies and providers may wish to make improvements in their individual systems or with a regional group by participating in a voluntary consortium focused on a specific set of issues. We recognize that actions to improve can be complimented by both traditional CQI models and by newer, more expedient versions such as the Rapid Cycle Improvement model. Flexibility is the key to meeting the divergent needs of all EMS systems in the state.

Organizational Structure Flow of Information & Activity



EMS SYSTEM IMPROVEMENT

Operating Procedures

Objectives

- 1) To develop statewide consortia focused on continuous quality improvement.
- 2) To identify structure, process, and outcome indicators for quality improvement.
- 3) To share comparable data with consortium members and with EMSA.
- 4) To develop and refine standards and benchmarks.
- 5) To make frequent and continuous changes on a real-time basis in how services are delivered based upon the benchmarks.
- 6) To disseminate results.

Process For Consortia Membership

Process for consortia membership is based on the following criteria:

- 1) Agreement on the rules of engagement
- 2) Satisfactory completion of a Needs Assessment survey
- 3) Submission of participation contract letter

Rules Of Engagement

- 1) Willingness to participate with in-kind contribution
 - In-kind contribution may vary across consortia based on specific consortia projects, but participants should be prepared to donate staff time, as needed.
- 2) Willingness to engage in communication to discuss the results of data collection and evaluation and improvement issues. This communication may take the form of:
 - Monthly meetings
 - Weekly conference calls
 - Daily E-mail and List Serve updates
- 3) Willingness to adhere to timelines
- 4) Agreement by all participating sites on the data collection protocol
- 5) Ability to collect, analyze, and share data for best practices
- 6) Ability to engage in short test cycles
- 7) An understanding that indicator variation will exist across sites and that the process is collegial, not competitive
- 8) Eventual public release of blinded data

Needs Assessment Survey

In order to determine preparedness for consortium participation, a Needs Assessment survey will be administered to all potential participating EMS agencies. Four areas will be assessed.

- Administrative
- Data Usage
- Clinical
- Technical

Each area will be covered by the appropriate personnel and approved by the local EMS agency administrator. (See Appendix D for a sample of the Needs Assessment Survey)

Training

Those agencies or providers determined to need further training in one or more of the areas assessed on the Needs Assessment survey will be provided with targeted training to 'bring them up to speed' before they join the consortium.

Participation Contract

After the administration and scoring of the Needs Assessment surveys, a letter will be sent by the lead agency to all qualifying agencies inviting them to participate in the project. The lead administrator of each of the qualifying agencies will be asked to sign, date, and return a letter confirming their intent to participate based upon agreement with the intents and purposes of the consortium.

Engaging In Quality Improvement

As depicted in the general PDSA model and the EMS-specific RCI model, both shown on the next page, quality improvement proceeds by a series of sequential steps, each of which is crucial to making a successful improvement. In the first phase, critical foundation is laid by planning what is to be done and how. For EMS RCI this includes developing a data collection protocol.

Data Collection Protocol

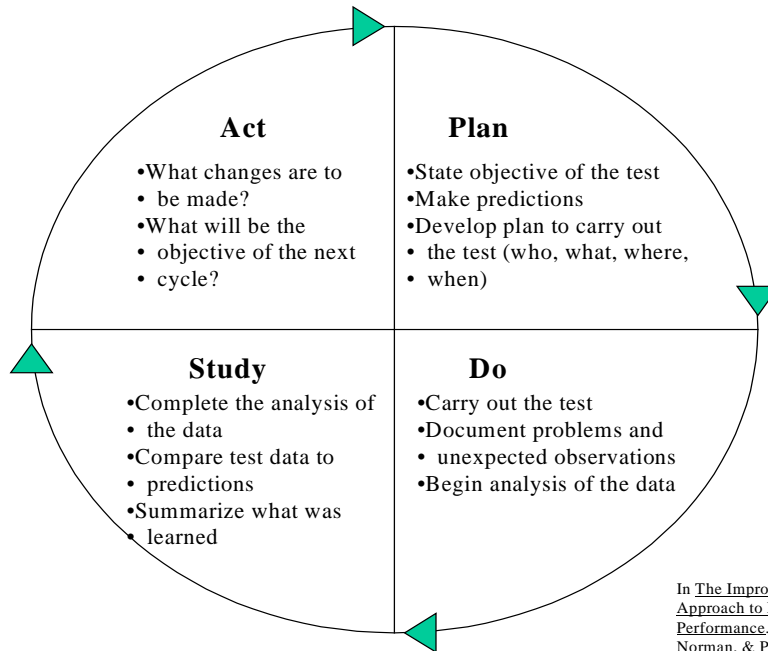
The data collection protocol should cover the following areas:

- 1) Background information
- 2) Objectives of the study cycle
- 3) Description of the population/sample
- 4) Description of the study design
- 5) Definitions of key terms and data elements
- 6) Identification of underlying factors that may affect results
- 7) Data analysis plan

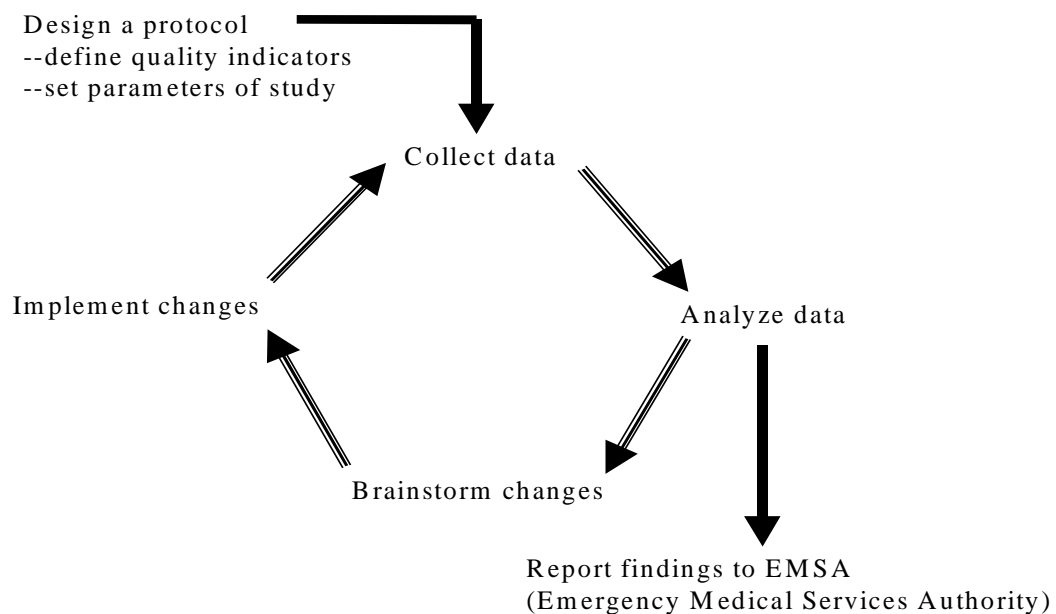
Sample RCI Project

While participants in this grant did not enter into the improvement phase of RCI due to doubts regarding data validity and reliability, the Mountain-Valley EMS Agency did conduct an individual quality improvement project that proved to be successful. For a full description of the project see Appendix E.

The Plan-Do-Study-Act Cycle (PDSA)



Rapid Cycle Improvement Within the EMS System



Funding

FUNDING

In order to carry this work forward, the management team applied for continuation funding through the state's FY 2000/2001 Block Grant Funding process. This was the funding mechanism used for years one and two. Concurrent to the application period, EMSA was awarded a \$1.3 million OTS grant for data system development. In part due to this development, and due to a lack of block grant funds, the management team's continuation grant application was denied and the state formed an *ad hoc* data committee, convened by Bonnie Sinz, a participant in the present project. The ad hoc committee comes under the auspices of the OTS grant. It will continue to gather and compare raw data according to the model the present project developed in an effort to better understand the indicator needs of providers. As this project's work is thus being carried forward, grant-seeking efforts have decreased accordingly. However, if funds are needed to carry the work forward in the future, the sources listed below may be useful.

- Agency for Healthcare Research and Quality (AHRQ)
www.ahrq.gov/fund
- California Endowment
www.calendow.org
- Maternal and Child Health Bureau (MCHB)
<http://www.mchb.hrsa.gov/html/grantsguidance.html>
- National Center for Injury Prevention and Control (NCIPC)
<http://www.cdc.gov/ncipc/res-opps/grants1.htm>
- National Emergency Medicine Association (NEMA)
<http://www.nemahealth.org/aboutus.html#Anchor-RESEARCH-47482>
- National Heart, Lung, and Blood Institute (NHLBI)
<http://www.nhlbi.nih.gov/funding/index.htm>
- National Institute of Child Health and Human Development (NICHD)
www.nichd.nih.gov/funding/funding.htm
- Emergency Medical Services for Children (EMS-C)
<http://www.ems-c.org/funding/framefunding.htm>
- National Highway Traffic Safety Administration (NHTSA)
<http://www.nhtsa.dot.gov/>

In addition to contacting these agencies directly, grant seekers can use the GRANTSINFO resource of the Division of Extramural Outreach & Information Resources, Office of Extramural Research, Office of the Director, National Institutes of Health (NIH). GRANTSINFO is the point of contact for obtaining general information about NIH extramural research programs, and the clearinghouse for application kits and forms.

Lessons Learned

LESSONS LEARNED

Lessons learned during the project have been disseminated in various media, including conference presentations and publications (Sobo et al. 2000a, 2000b, n.d.). Below is a summary of the lessons learned, followed by the recommendations generated.

1. Leadership

Leadership is key to successful implementation. The lead agency must take an active role in facilitating and monitoring the activities of the group. It must be clear to the participating agencies who is leading the process, what must be done, and how it should be done.

2. Consensus

The lead agencies must be open to the consensus-building process. All participants must trust and believe in the work that is being done. A strong facilitation and consensus-building component must be integrated into the structure.

3. Common Indicators

The indicators are the most important tool in communicating what is to be collected and how. The indicators simplify the process of comprehending the implications of data. The indicators serve as a 'digestive aid' for taking data and giving them a common meaning to all participants.

4. Data Collection Technology

Diversity of organizations fosters diversity in data collection systems. However, so long as standard definitions and uniform data elements have been agreed upon, and indicators are uniformly derived, exactly how data are stored and collected can be left to each individual agency.

5. Sometimes Close Counts in System Evaluation

In some cases (i.e., when data procurement was problematic), the grant team had to base decisions regarding indicator results on best approximations vs. exactly calculated statistics. This was acceptable because of the volume of results and the consistency in trends. It is important for organizations to agree that although their work will not always be perfect they can still reach consensus on the implications of the findings.

6. A Tiered System for Quality Indicators

Some indicators are suitable for gross analysis at the statewide level (for example success rates for ET and IV), while others are regionally specific and difficult to compare statewide due to the great diversity across EMS systems. Quality improvement will be most effective when we begin by comparing similar systems to one another and then graduate to the statewide level.

7. We Can't Work on Improvement Until We Can Standardize

The data collection process has to be standardized. If we try to make improvements based upon faulty data, they will at best be ineffectual. Data collection methodology must be rigorously maintained and training in data collection must be provided if needed.

Recommendations

RECOMMENDATIONS

- 1) Institute a State EMS System and Evaluation Improvement Section, to be housed under the auspices of the State EMS Authority.
- 2) Establish a statute mandating quality improvement for EMS systems and allocating funding to support quality improvement statewide.
- 3) Establish standards and guidelines that define the minimum benchmark structural, process, and outcome indicators, and their associated data elements. These definitions and standards must be consistent statewide before any broad-based system analysis can occur.
- 4) Develop a tiered system of performance indicators. Select indicators for which data are standardized statewide for the minimum statewide data set. Reserve other indicators for local and regional comparisons.
- 5) Require grassroots involvement in indicator selection and development to assure provider buy-in and indicator standardization across systems. Local providers know what is and is not available and how they do and do not define concepts.
- 6) Provide technical assistance in the field in order to collect valid and reliable data. No matter how well intended providers may be, and no matter how specific our definitions are, it is unfair to assume that providers are scientists.
- 7) Use dynamic data presentation, such as run charts or control charts. This type of presentation is best for QI because it allows EMS personnel to see, first hand, how performance can change over time when QI strategies are implemented.
- 8) Implement a comprehensive training program at the state, local and provider levels to ensure standardized data collection and continuous quality improvement.

Appendix A

California Statewide EMS System Evaluation Project

Index of Indicators

| QUALITY INDICATOR | CLASS | INCLUSION CRITERIA | DATA POINT NUMERATOR | DATA POINT DENOMINATOR | REPORTING FORMULA | REPORTED INDICATOR ITEM |
|---|-----------------|--|---|--|--|---|
| % ADULT ORAL ET SUCCESS RATE | Prehosp Process | Patients age 15 years or older treated by EMS personnel | Total number of patient cases where oral ET intubation was successful | Total number of patients cases where oral intubation was attempted one or more times | Total success /total patients x 100 = % | % ADULT ORAL ET SUCCESS |
| % PEDIATRIC ORAL ET SUCCESS RATE | Prehosp Process | Patients age up to 10th birthday or younger older treated by EMS personnel | Total number of pediatric patient cases where oral ET intubation was successful | Total number of pediatric patients cases where oral intubation was attempted one or more times | Total success /total patients x 100 = % | % PEDIATRIC ORAL ET SUCCESS |
| % ADULT PERIPHERAL IV SUCCESS RATE | Prehosp Process | Patients age 15 years or older treated by EMS personnel | Total number of patient cases where peripheral IV was successful | Total number of patient cases where peripheral IV was attempted one or more times | Total success/patient cases x 100 = % | % ADULT PERIPHERAL IV SUCCESS |
| ASSESSMENT BASED TREATMENT - ADULT Coronary Ischemic Chest Pain-Oxygen | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patients cases receiving oxygen | Total number of patient cases assessed by EMS personnel as having coronary ischemic chest pain | Total received oxygen/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT CICP + OXYGEN |
| ASSESSMENT BASED TREATMENT - ADULT Coronary Ischemic Chest Pain-EKG | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patients cases receiving EKG Monitor | Total number of patient cases assessed by EMS personnel as having coronary ischemic chest pain | Total received IV/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT CICP + EKG |
| ASSESSMENT BASED TREATMENT - ADULT Coronary Ischemic Chest Pain-IV | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patients cases receiving Peripheral IV | Total number of patient cases assessed by EMS personnel as having coronary ischemic chest pain | Total received IV/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT CICP + IV |

| QUALITY INDICATOR | CLASS | INCLUSION CRITERIA | DATA POINT NUMERATOR | DATA POINT DENOMINATOR | REPORTING FORMULA | REPORTED INDICATOR ITEM |
|--|-----------------|--|--|---|---|--|
| ASSESSMENT BASED TREATMENT - ADULT Coronary Ischemic Chest Pain-aspirin | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patients cases receiving aspirin | Total number of patient cases assessed by EMS personnel as having coronary ischemic chest pain | Total received aspirin/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT CICP + ASPIRIN |
| ASSESSMENT BASED TREATMENT - ADULT Coronary Ischemic Chest Pain-Nitroglycerine | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patients cases receiving nitroglycerine | Total number of patient cases assessed by EMS personnel as having coronary ischemic chest pain | Total received oxygen/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT CICP + NTG |
| ASSESSMENT BASED TREATMENT - ADULT Coronary Ischemic Chest Pain-Morpine | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patients cases receiving morphine | Total number of patient cases assessed by EMS personnel as having coronary ischemic chest pain | Total received morphine/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT CICP + MS |
| TIME ON SCENE – 10 mins Coronary Ischemic Chest Pain (CICP) - | Prehosp Process | Patients age 15 years or older who are assessed by EMS | Total number of reported with coronary ischemic chest pain with scene times 10 mins or less | Total number of patients cases | Total number of reported patient cases with scene times under 10 mins/ total number of patients with CICP x 100 = % | % SCENE TIMES WITHIN 10 MINS OR LESS - CORONARY ISCHEMIC CHEST PAIN |
| ASSESSMENT BASED TREATMENT - ADULT Resp Distress with wheezes - % Compliance - OXYGEN | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patients cases receiving oxygen | Total number of patient cases assessed by EMS personnel as having respiratory distress with bronchospasm | Total received oxygen/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT RESP DIST + OXYGEN |
| ASSESSMENT BASED TREATMENT - ADULT Resp Distress with wheezes - % Compliance - BRONCHO-DILATOR | Prehosp Process | Patients age 15 years or older who are assessed by EMS personnel | Total number of patient cases receiving a broncho -dilator medication | Total number of patient cases assessed by EMS personnel as having respiratory distress with bronchospasm | Total received broncho dilator medication/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX ADULT RESP DIST + BRONCHO - DILATOR |

| QUALITY INDICATOR | CLASS | INCLUSION CRITERIA | DATA POINT NUMERATOR | DATA POINT DENOMINATOR | REPORTING FORMULA | REPORTED INDICATOR ITEM |
|--|------------------|---|--|--|---|--|
| ASSESSMENT BASED TREATMENT - PEDIATRIC Resp Distress with wheezes - % Compliance - OXYGEN | Prehosp Process | Patients who have not yet reached their 15 th birthday and who are assessed by EMS personnel | Total number of patient cases receiving oxygen | Total number of patients cases assessed by EMS personnel as having respiratory distress with bronchospasm | Total received oxygen/total patients x 100 = % | % COMPLIANCE ASSESS BASED TX PEDIATRIC RESP DIST + OXYGEN |
| ASSESSMENT BASED TREATMENT - PEDIATRIC Resp Distress with wheezes - % Compliance - BRONCHO-DILATOR | Prehosp Process | Patients who have not yet reached their 15 th birthday and who are assessed by EMS personnel | Total number of patients case receiving a broncho dilator medication | Total number of patient cases assessed by EMS personnel as having respiratory distress with bronchospasm | Total received broncho dilator medication/ total patients x 100 = % | % COMPLIANCE ASSESS BASED TX PEDIATRIC RESP DIST + BRONCHODILATOR |
| CRITICAL TRAUMA ADULT - SCENE TIMES 10 Min or Less | Prehosp Process | Patients 15 yrs of age or older with any mech of inj with no complicated rescue | Total number of reported critical trauma patient cases with scene times 10 mins or less | Total number of critical trauma patients cases | Total number of reported critical trauma patient cases with scene times under 10 mins/ total number of critical trauma patients x 100 = % | % SCENE TIMES WITHIN 10 MINS OR LESS CRITICAL TRAUMA |
| CARDIAC ARREST - SURVIVAL TO HOSPITAL ADMISSION - | Hospital Outcome | Patients 15 years or older with documented absence of pulse and respirations (non-traumatic) | Total number of patient cases in cardiac arrest admitted to hospital | Total number of patient cases reported in cardiac arrest | Total patients cases admitted/Total Patients cases in cardiac arrest x 100 = % | % SURVIVAL TO HOSPITAL ADMISSION - ALL CARDIAC ARREST |
| CARDIAC ARREST - TRANSPORT TO HOSPITAL | Outcome | Patients over age 15 with documented absence of pulse and respirations (non-traumatic) | Total number of patients cases in cardiac arrest transported by EMS personnel to hospital | Total number of patient cases reported in cardiac arrest | Total patients transported/ Total Patients in cardiac arrest x 100 = % | % TRANSPORT TO HOSPITAL ALL CARDIAC ARREST |

| QUALITY INDICATOR | CLASS | INCLUSION CRITERIA | DATA POINT NUMERATOR | DATA POINT DENOMINATOR | REPORTING FORMULA | REPORTED INDICATOR ITEM |
|---|---------------------|---|---|--|---|---|
| PSAP Time Interval | Disp Process | all pts 15 yrs or older where defibrillation administered by prehospital personnel | cumulative seconds from phone pick up to call effect | total pts defibrillated | cumulative seconds/ total patients = mean/average PSAP time interval | (secs) Average PSAP Time Interval |
| Secondary Dispatch Agency Time Interval | Disp Process | all pts 15 yrs or older where defibrillation administered by prehospital personnel | cumulative seconds from pick up to call effect | total pts defibrillated | cumulative seconds/ total patients = mean/average 2ndary dispatch center Time Interval | (secs) Average 2ndary Disp Time Interval |
| Roll Time Prehospital Response Unit | Provider Process | all pts 15 yrs or older where defibrillation administered by prehospital personnel | cumulative seconds from call effect to arrival of responding unit on scene | total pts defibrillated | cumulative seconds/ total patients x 60 = mean/average Roll Time in mins | (Secs) Average Roll Time |
| % Return of Spontaneous Circulation (ROSC) Prehospital Defibrillation | Hospital Outcome | Patients 15 years or older defibrillated by prehospital personnel | Total number of patients with documented ROSC after prehospital defibrillation | Total number of reported patients defibrillated | Total patients with ROSC/Total Patients defibrillated x 100 = % | % Return of Spontaneous Circulation |
| % Survival to Hospital Admission Prehospital Defibrillation | Hospital Outcome | Patients 15 years or older defibrillated by prehospital personnel | Total number of patients admitted to hospital after prehospital defibrillation | Total number of reported patients defibrillated | Total patients admitted/Total Patients defibrillated x 100 = % | % Cardiac Arrest Admit to ED |
| % Discharged from Hospital Alive Prehospital Defibrillation | Hospital Outcome | Patients 15 years or older defibrillated by prehospital personnel | Total number of patients discharged alive from hospital after prehospital defibrillation | Total number of reported patients defibrillated | Total patients discharged/ Total Patients defibrillated x 100 = % | % Cardiac Arrest Discharged from Hospital Alive |
| Destination of trauma criteria patients (<i>criteria defined by each LEMS</i> A) | Prehosp. Process | Patients over 15 years of age | Total number of trauma patients meeting LEMS A trauma criteria and transported to a designated trauma center | Total number of trauma patients meeting LEMS A trauma criteria | Total patients transported to Trauma Center/Total number of trauma patients x 100=% | % Trauma Trage Destination Compliance |
| Destination of pediatric patients (<i>criteria defined by each LEMS</i> A) | Prehosp. Process | Patients 14 years of age and under | Total number of pediatric patients meeting LEMS A pediatric criteria and transported to a designated pediatric center | Total number of pediatric patients meeting LEMS A pediatric criteria | Total patients transported to Pediatric Center/Total number of pediatric patients x 100=% | % Pediatric Triage Destination Compliance |

California Statewide EMS System Evaluation Project
 EMS SYSTEM PERFORMANCE INDICATOR
PERIPHERAL INTRAVENOUS (IV) SKILL SUCCESS RATE – ADULT

DEFINITIONS

success rate: percentage (%) of successful placement of peripheral intravenous access device by EMS personnel per each patient

patient case: an individual patient on whom EMS personnel have performed one or more attempts to puncture the skin with a needle catheter device with intent to gain access to peripheral venous circulation

success: access to peripheral venous circulation as evidenced by ability to infuse intravenous fluids

adult: patients who have reached the age of 15 years or more

REPORTING

format: % success rate per (aggregate summary)

reporting formula: number successes divided by total number patient cases x 100 = %

data needed -

inclusion criteria: all patients age 15 yrs or older treated by EMS personnel

numerator: total number of patients where peripheral IV was successful

denominator: total number of patients cases

minimum points: n = 30

reporting period: monthly or annually (minimum 12 consecutive months)

data source: patient care documents (documented by EMS personnel)

| REPORTING EXAMPLE | |
|-----------------------------------|--|
| reporting period = | month of 7/99 |
| numerator = | total number of successful peripheral IV's (N= 1769) |
| denominator = | total number of patient cases (N= 2021) |
| formula = | numerator/denominator x 100 = % (1769/2021) x 100 = 87 % |
| summary indicator reported item = | 87% success peripheral IV - adult |

ANALYSIS

Process: Variation - Special Causation

Outcome: Benchmark Comparison - Best Practices

STATE BENCHMARK TBD by baseline data collection

BENCHMARK REFERENCES

1. 91% success rate – Los Angeles CA
 Jones SE, Nesper TP, Alcouloumre E. Prehospital intravenous line placement: A prospective study. *Annals of Emergency Medicine*; 18:244, 1989.
2. 71% success rate – Arizona
 DW, Valenzuela TD, Meislen HW, Criss EA. A prospective comparison of intravenous line placement by urban & non urban ALS personnel. *Prehospital & Disaster Medicine*; Sup 13S, Jul 1992.
3. 80% success rate – Pittsburgh PA
 Carducci B. Intravenous maintenance with saline lock in prehospital environment. *Prehospital & Disaster Medicine*; 9:67, Jan 1994.

Appendix B

Indicator Reporting Sheet

Refer to the enclosed indicator descriptions for definitions, criteria and reporting formulas. Please post any questions to the list serve. If you cannot get data for a particular indicator, leave it blank and see the attached worksheet.

Agency Name _____

Contact Person _____ **Phone** _____

Reporting Period _____
(12 consecutive months between Jan 1996 – June 1999)

- 1) # _____ / _____ % Oral Endotracheal Intubation (ET) Skill Success Rate – Adult
- 2) # _____ / _____ % Peripheral Intravenous (IV) Skill Success Rate – Adult
- 3) # _____ / _____ % Compliance Oxygen Administration – Respiratory Distress with Wheezes - Adult
- 4) # _____ / _____ % Compliance Bronchodilator Administration – Respiratory Distress with Wheezes - Adult
- 5) # _____ / _____ % Compliance Oxygen Administration – Respiratory Distress with Wheezes – Pediatric
- 6) # _____ / _____ % Compliance Bronchodilator Administration – Respiratory Distress with Wheezes - Pediatric
- 7) # _____ / _____ % Scene Time within 10 Minutes or Less – Critical Trauma Patient – Adult
- 8) # _____ / _____ % Survival to Admission – Cardiac Arrest
- 9) # _____ / _____ % Transported to Hospital – Cardiac Arrest

Indicator Worksheet

We would appreciate you answering the following questions for any or all of the indicators. Your answers will help us to better understand the process of gathering data in the EMS system. You may attach additional sheets, as needed.

Agency Name _____

Contact Person _____ Phone _____

- 1) Indicator title?
- 2) What difficulties did you encounter in gathering the data? How did you resolve them, if you were able?
- 3) How did you derive the numerator (how did you sort your data)?
- 4) How did you derive the denominator (how did you sort your data)?
- 5) Do you feel these numbers reflect your true activity? If not, why not?
- 6) How many cases were N/A? For what types of reasons?
- 7) What did you learn from this process and/or what further questions would you like answered regarding the data?
- 8) Additional comments?

Appendix C

DISPATCH TIME SURVEY

Provider Agency Name: _____ Public Provider Private
Provider

Do you automatically synchronize your clocks with the atomic clock? Yes No
If yes, how often? _____

Does your agency have a dispatch center? Yes No

Is your dispatch agency the primary PSAP for 9-1-1 calls? Yes No
(PSAP Definition: Public Safety Answering Point or dispatch
center where a public EMS 9-1-1 call answered.)

How many PSAPs does a caller access on a typical 9-1-1 EMS call? 1 2 3
More

PSAP CALL RECEIPT TIME

DEFINITION: Time when caller accesses the 9-1-1 system's primary PSAP.

Is this time captured by your agency's data system? Yes No N/A

If no, are you able to obtain this data from the PSAP? Yes No

If yes, are you able to match the data from the primary PSAP with data from your system? Yes No

If yes, electronically matched by hand from logs

Are the PSAP times and your dispatch agency synchronized? Yes No N/A

If yes, how? _____

If no, what is the approximate time difference? _____:_____ Unknown
min sec

OTHER REPORTED TIMES:

| TIME | DEFINITION | QUESTIONS |
|---|---|---|
| Secondary (or Tertiary) Dispatch Center Call Receipt Time | Time when a public or private dispatch center receives a call from a primary (or secondary dispatch center) PSAP. | Is this time captured by your data system? Yes No N/A |
| Determine Time | Time when dispatch agency | Is this time captured by your |

| | | |
|-----------------------|---|---|
| | determines the appropriate response level for call. | data system? Yes No |
| | | |
| Dispatch Time | Time when responding units are officially alerted of a request for response by a designated dispatching agency. | Is this time captured by your data system? Yes No Is this the actual time that responding units are dispatched? Yes No |
| <i>Response Time</i> | Time when responding units “turn a wheel” in response to the call. There is probably an official definition... | Is this time captured by your data system? Yes No How is this time recorded? entered into data retrospectively electronically captured when unit personnel notify dispatch |
| Arrival On Scene Time | Time when the responding unit reports that they have reached the location as requested by dispatch agency. | Is this time captured by your data system? Yes No How is this time recorded? entered into data retrospectively electronically captured when unit personnel notify dispatch |
| At Patient Time | Time when the responding unit reports that they have reached the actual patient. | Is this time captured by your data system? Yes No How is this time recorded? entered into data retrospectively electronically captured when unit personnel notify dispatch |
| Left Scene Time | Time when the transporting unit reports that they have left the scene with the patient. | Is this time captured by your data system? Yes No How is this time recorded? entered into data retrospectively electronically captured when unit personnel notify dispatch |

| | | |
|--------------------------|---|--|
| Arrival At Hospital Time | Time when the transporting unit reports that they have arrived at the receiving hospital. | <p>Is this time captured by your data system? Yes No</p> <p>How is this time recorded? entered into data retrospectively electronically captured when unit personnel notify dispatch</p> |
| Defibrillation Time | Time when EMS personnel deliver a defibrillatory shock to the patient. | <p>How is this time collected by your agency? EMS reports Data base</p> <p>Is this time synchronized with your dispatch center's time? Yes No</p> |

Appendix D

NEEDS ASSESSMENT

Administrative Criteria (to be completed by the Agency Administrator):

1. Are you interested and willing to participate in the EMS System Evaluation Rapid Cycle Improvement Project? Yes_____ No_____
2. If yes, what level of participation would you like to be considered for?
_____ *Phase 1: A pilot project utilizing the Rapid Cycle Improvement approach.*
_____ *Phase 2: Stay informed and consider participation at a later date.*
3. Are you willing to share:
a) data widely within your organization? Yes_____ No_____
b) data with other project participants? Yes_____ No_____
c) blinded data in peer review publications? Yes_____ No_____
4. In-kind contributions for participation in the project will include time, travel, training and services for the following individuals and groups in your organization: project manager, data manager, medical director/administrator, quality improvement staff and information services staff. Is your organization able to commit this level of in-kind resources to the project?
Yes_____ No_____

Agency Administrator's Signature

Date

Usage of Data Criteria (to be completed by the Agency Administrator or designee and reviewed by the Agency Administrator):

1. Do you share data internally (within your EMS agency) for quality improvement?
Yes_____ No_____

Do you share data externally (with providers, hospitals, public) for quality improvement? Yes_____ No_____

Please give specific examples of how you have shared data both internally and externally and how often this occurs.

2. Rate your ability to use data in order to make decisions for quality improvement within your EMS organization. [Please rank from 1(no ability) to 5 (very able)].

3. Do you have a quality improvement plan for your organization?
Yes_____ No_____

If yes, please attach a copy (only a summary is required).

4. How do you hold your providers and staff accountable for clinical quality and improvement?

Please describe the processes you have in place for achieving accountability when staff and providers do not meet standards.

5. Are you currently using, or have you previously used, outcome measures in your organization? Yes_____ No_____

Please provide examples (specify section and question number for any attachments).

6. Please list the top three strategic priorities of your organization over the next three to five years.

1. _____
2. _____
3. _____

7. How important are outcomes in your strategic priorities? [Please rank from 1 (not important) to 5 (very important)] _____

8. How does your Medical Director provide medical input into:

- the decision-making process at your agency?
- the data system review process at your agency?

Do you access additional MD input? If so, how?

9. Areas of outcome study for this project may include one or more of the following patient conditions. Please check those in which you would consider participating.

_____ Trauma _____ Chest Pain _____ Cardiac Arrest

10. Please describe any other grant-funded projects associated with QI, system evaluation, or data that you are currently participating in.

11. Do you currently collect data to contribute to State or National databases?

Yes_____ No_____

If yes, which ones?

How often do you submit data?

_____ 1x month _____ 1x 6 months _____ 1x year _____ other, please specify

12. Who would be the project manager for the EMS System Evaluation Rapid Cycle Improvement project (please provide name and title)?

Completed by:

Reviewed by:

Name

Agency Administrator

Title

Date

Clinical Criteria (to be completed by the Agency Administrator or designee and reviewed by the Agency Administrator):

1. Do you currently have treatment guidelines/policies in place for (please check all that apply):

_____Trauma _____Chest Pain _____Cardiac Arrest

2. Are you currently, or have you previously, participated in studies on any of the above areas? Yes_____ No_____ (not including the current RCI study).

If yes, please describe (attach supporting documents, specifying section and question number).

3. Are you currently, or have you in the past, participated in quality improvement projects in the above areas? Yes_____ No_____
- In any other areas? Yes_____ No_____

If yes, how many _____

Please describe (attach supporting documents, specifying section and question number).

4. Do you collect quality indicators within your organization?
Yes_____ No_____

If yes, please include a list of your routinely collected quality indicators, and specify for each how you collect them (attachments should specify section and question number).

5. Have you used clinical data to make decisions and effect change within your organization? Yes_____ No_____

If yes, please describe (attach supporting documents, specifying section and question number).

Completed by:

Reviewed by:

Name

Agency Administrator

Title

Date

Technical Criteria (to be completed by the Agency Administrator or designee and reviewed by the Agency Administrator):

1. Please describe what processes, mechanisms and audits you have in place to ensure and measure the quality of your patient information (provide examples including data quality reports and recent coding audits).

2. Please describe your data collection systems in the following areas:

Patient level

Financial/billing

Other

3. What is the time lag between the date patient data is collected and when it can be accessed for analysis? (Please specify in number of weeks) _____

4. To what extent is your data linked to hospital or patient outcome data (for example, ED disposition or hospital discharge status)?

Is this data loaded into a comparative/relational database?

Yes_____ No_____

If yes, please specify name: _____

What is the time lag between the date this data is collected and when it can be accessed for analysis? (Please specify in number of weeks) _____

5. How are your structure, process, and outcome indicators collected:

reviewed:

analyzed:

How is the quality of this data ensured?

6. Describe your ability to track the various EMS personnel (including their level of training) caring for a patient.

How do you ensure the accuracy of this information?

7. Are you familiar with patient severity adjustment strategies?
Yes_____ No_____

If yes, do you currently use severity adjustment strategies for patient data?
Yes_____ No_____

8. How do you analyze patient data? Please describe on an individual patient level and on an aggregate level.

Individual patient level:

Aggregate level:

We use the following aggregate methods of data analysis (Please check all that apply):

Measures of central tendency: _____mean _____median _____mode
Measures of variation: _____range _____standard deviation

10. Do you now, or have you in the past, compared the performance of EMS personnel and/or providers with respect to specific quality indicators?
Yes_____ No_____

If yes, please describe and attach the most recent example (specifying section and question number)

11. Is there a data dictionary readily available listing database items/fields and descriptions? Yes_____ No_____ (If yes, please attach, specifying section and question number)

12. How many benchmarking and/or performance comparison projects have you participated in the last three years?

_____0 _____1-3 _____4-6 _____>6

Please attach a summary of a recent example, specifying section and question number.

13. Describe your computer system (e.g., number and type of PCs/laptops, type of desktop software, type of data management software, Internet access).

14. Do you have a plan in place to update or change your systems?
Yes_____ No_____

If yes, please describe:

Completed by:

Reviewed by:

Name

Agency Administrator

Title

Date

Appendix E

LOCAL DEMONSTRATION OF CQI MODELS

What follows is an illustration of two separate CQI programs tested and implemented at the Local EMS Agency level. The programs demonstrate two different approaches to implementing CQI on a system-wide level. The first program employs the Rapid Cycle Improvement model and the second utilizes a more traditional model.

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